

Faculty of Science

M.Sc. (Data Science)

DEPARTMENT OF STATISTICS & OPERATIONS RESEARCH
ALIGARH MUSLIM UNIVERSITY ALIGARH

Syllabus for Entrance Test

Section I: Mathematics (20 Questions)

Sequence and series, convergence of sequence of real numbers. Functions and their properties, limits, continuity and differentiability of functions, function optima, increasing and decreasing functions. Matrix algebra and its properties. Elementary set theory, vector space, subspaces, linear transformations, rank, nullity, eigen values, system of linear equations.

Section II: Statistics (30 Questions)

Data types and their presentation. Measures of central tendency, dispersion, skewness and kurtosis. Karl-Pearson's and Spearman's rank correlation coefficients and simple regression analysis.

Definition and axioms of probability, probability of events, addition and multiplication rules, conditional probability, independence of events, and Bayes' theorem. Random variables, probability mass function, probability density function, cumulative distribution function. Mathematical expectation. Distribution of functions of random variables.

Some standard discrete and continuous probability distributions: binomial, geometric, negative binomial, Poisson, hypergeometric, uniform, exponential, gamma, beta and normal. Concept of sampling distribution, central limit theorem and test of significance based Z , t , X^2 and F distributions. Properties of good estimators. Methods of estimation (maximum likelihood and method of moments).

Section III: Linear Programming Problems and Statistical Quality Control (25 Questions)

Linear programming problem (LPP), graphical and simplex methods, artificial variable techniques, concept of duality in LPP, dual simplex method. Transportation and assignment problems. Basics of statistical quality control, statistical quality control charts (variables and attributes).

Section IV: Computer Science, General Awareness and Reasoning (25 Questions)

Basics of computer science, C++ programming concepts. Introduction to R language, data objects in R, vector, matrix, and data frame, listed data objects. Data import and export. Operators (arithmetic, logical and assignment), Basic matrix operations and graphics in R. Logical, analytical, mathematical, Verbal and non-verbal reasoning.

Note: There will be 100 MCQs, each carrying one mark.